

LAW OFFICES  
McGuire Woods LLP  
1750 TYSONS BOULEVARD, SUITE 1800  
MCLEAN, VIRGINIA 22102

APPLICATION  
FOR  
UNITED STATES  
LETTERS PATENT

Applicants: Thomas Grafenauer  
For: WOOD FIBERBOARD, IN PARTICULAR  
FLOOR PANEL  
Docket No.: 03100134US

### **Wood fiberboard, in particular floor panel**

The invention relates to a wood fiberboard, in particular a floor panel, comprising an HDF support board with a top side and an underside, the top side having a decoration, preferably a wood or tile decoration, and to a process for producing such a wood fiberboard.

Floor panels with a wood-fiber support board are usually referred to as laminate panels and have been commercially available for many years as a substitute for parquet flooring. The desired decoration (parquet, woodgrain, tiles, etc.) is printed onto a paper web, which is then coated with resin and rolled onto a roll. At the floor manufacturer's, the decorative web which has been prefabricated in this way is positioned on the support board and pressed. As a result of the operations of printing the decoration on to the paper web, of subsequently sealing the paper web with synthetic resin and of then connecting the decorative layer to the support board by pressure and temperature, the dimensions of the paper web change. According to the person skilled in the art, the paper grows. The paper grows both in length (increase in length) and in width (increase in width). If this decorative board is then to be cut to size to form individual panels, the increase in length and width has to be taken into account because, otherwise, the decoration would be distributed unevenly on the individual panels. This would result in the floor made up of an unevenly distributed decorative layer having the decorations offset along the connecting edges of the panels. Even if the decorations are only offset by a few millimeters, they are obvious to the observer, this having an adverse effect on the esthetic appearance and thus reducing the quality of the covered floor.

In order for it to be possible to carry out production with appropriate quality, the paper growth has to be detected and the saw which saws the panels from the support board has to be set correspondingly. Manual  
5 setting is very time-consuming. DE 100 19 054 C1 describes a process which is intended for cutting panels to size from a support board and by means of which the saw can be automatically adapted to the paper growth. Cameras are necessary for this purpose, the  
10 cameras determining the actual position of defined points of the decoration. The actual position is then compared with the desired position and the deviation of the width or length dimension is determined, with the result that the saw can be set correspondingly.

15 In order to optimize the cutting, fairly high outlay is thus necessary, and this increases the cost of the production of high-grade panels. In order further to match the appearance of the laminate panel to the  
20 appearance of a natural-wood panel, a relief-containing female die may be provided in the press in which the decorative layer is pressed with the support board, a relief which corresponds to the woodgrain being stamped into the synthetic resin layer by means of said die.  
25 Since the paper growth is not reproducible, it is not possible to make the relief correspond fully with the decoration. The joints of a tiled surface cannot be stamped into the surface of the synthetic-resin layer since deviations would be immediately visible here.

30 Taking this problem as the departure point, the intention is to improve the wood fiberboard described in the introduction.

35 The problem is solved, in the case of a wood fiberboard of the generic type, in that the decoration is printed directly onto the top side of the support board and is covered by at least one layer of a transparent

synthetic resin, preferably melamine resin or urea resin.

5 In addition, it is also possible for the decoration to be printed onto the underside of the support board and to be covered by at least one layer of a transparent synthetic resin. If appropriate, the underside and/or the top side of the support board may be provided with a relief corresponding to the decoration, this relief  
10 being pressed into the synthetic-resin layer.

By virtue of this configuration, the paper layer is eliminated. During pressing of the synthetic-resin layer, the decoration changes neither in length nor in  
15 width. The saw which is subsequently used to cut panels to size, may be preset. It is possible to stamp into the synthetic-resin layer of the board designed according to the invention even the most intricate reliefs, which correspond precisely with the  
20 decoration. The production costs of high-quality panels are considerably reduced. A further saving is achieved in that the paper layer is dispensed with.

The decoration is preferably covered by two layers of a  
25 synthetic resin, the layer which is applied directly to the decoration having corundum particles for increasing the abrasion resistance.

A process for producing the wood fiberboard according to the invention is distinguished by the following  
30 steps:

- a) a decoration, preferably a wood or tile  
35 decoration, is printed onto one or two sides of the board;
- b) a screen roller is used to spread one or more synthetic-resin layers on the side with the

decoration (top side) and the sides located opposite the latter (underside);

- 5 c) the synthetic-resin layers are pressed with the board in a known manner in a short-cycle-press.

The absence of paper layers prevents the resulting boards from warping, which could be produced by the inherent tensile force of the papers. Short pressing 10 times may be realized as a result of the thin layers.

Instead of HDF (High Density Fiberboard), it is also possible for the support board to be made of MDF (Medium Density Fiberboard) or also a conventional 15 chipboard with a correspondingly finely distributed cover layer, from which, for example, smaller panels used for furniture construction can then be sawn.

Boards which are produced in this way may also be used 20 as floors in the [sic] they are sawn to form panels in a format appropriate to the decoration.